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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/723,263

11/26/2003

Gaetan L. Mathieu

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EXAMINER

CAZAN, LIVIUS RADU

ART UNIT

PAPER NUMBER

3729

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

01/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/723,263

Applicant(s)

MATHIEU ET AL.

Examiner

Livius R. Cazan

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 21-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 21-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

1. The amendment filed on 10/27/2006 has been fully considered and made of record.

Specification

2. The disclosure is objected to because of the following informalities: in paragraph [0028] as amended, "CULNVARCU" should probably read --CUINVARCU--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, newly submitted claim 31 discusses "providing an opening in the side of the cap exposed outside the substrate". There does not appear to be any support for this new limitation in the specification. Moreover figures 10-12, which appear to be directed to the claimed subject matter show an opening in the side of the cap located inside the substrate hole (see Fig. 11).

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular claim 1 recites "wherein a portion of the hole is open for insertion of a probe on a second substrate to electrically contact the probe with the barrier portion of the cap in the hole". It is unclear whether or not Applicant is claiming a step of inserting a probe located on a second substrate into the hole. It would appear that the hole must only be capable of receiving such a probe. This view is further strengthened by the language of claim 21, which states "the second end of the hole being open and capable of receiving a free end of a probe on a second substrate to contact electrically the cap inside the hole". Therefore, for examination purposes it will be assumed the hole must only be capable of receiving such a probe.

Claim Rejections - 35 USC § 102

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 1, 5-7, 21, 22, 27, 28, 30, and 32-36, are rejected under 35 U.S.C. 102(b) as being anticipated by Kubo (US5656798 to Kubo et al).

Kubo discloses providing an electrical contact cap (14, all figures) in a hole in a substrate (10, all figures), wherein the cap extends partially into the hole and partially outside the hole, and a portion of the cap inside the hole extends across the hole forming a barrier portion inside the hole closing the hole, wherein a portion of the hole is open for insertion of a probe to electrically contact the probe with the barrier portion of

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the cap in the hole (see Figs. 33, 44-47, and 76 for example; the open end of the hole can receive such a probe; see rejection under 35 U.S.C. 112, 2nd paragraph), **as in claims 1 and 21.**

The hole is plated with an electrically conductive material (13, Fig. 33) **as in claims 5 and 32**, the cap being retained in the hole using solder (15, Fig. 33), **as in claim 30.**

The cap comprises a laterally protruding portion (see Figs. 44-47 and 76) extending into the substrate to hold the cap within the substrate, **as in claims 6, 7, 27, and 28.**

The cap comprises a first cylindrical region extending outside the substrate (see all figures) having a greater diameter than a second cylindrical region provided in the hole of the substrate (see all figures), the lateral cross section of the portion of the cap within the hole closely conforming to the lateral cross section of the hole, **as in claims 7 and 33-36.**

The hole is formed before the cap is disposed in the hole (see abstract), **as in claim 22.**

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 2, 3, 25, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of Kuzma (US5046242).

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Kubo discloses the same invention as the Applicant, including utilizing a ceramic substrate (see alumina in the table in col. 5) and pressing the cap into the hole (see abstract).

However, Kubo does not disclose the substrate being a green sheet ceramic such that the cap is pressed into the hole before the green sheet ceramic is fired.

Kuzma teaches forming a feedthrough in a ceramic substrate by inserting a metal cap into a hole in a green sheet (i.e. unsintered) ceramic and thereafter heating the green sheet ceramic to form a ceramic substrate around the metal cap (see Fig. 6).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kubo by inserting the cap in an unsintered ceramic substrate and thereafter heating the substrate to secure the cap within the substrate since this is an art recognized equivalent method of securing a feedthrough structure in a substrate.

10. Claims 4 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of Applicant's admitted prior art (APA).

Kubo discloses the same invention as the Applicant, including the cap including an opening in the side of the cap exposed inside the substrate. Kubo does not disclose a step of inserting a resilient spring probe into this opening.

APA teaches the use of resilient spring probes on probe cards so as to temporarily connect to the probe to electrical components (page 2, para. [0006]).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert a resilient spring probe into the opening in order to make electrical contact between the probe and the conductive cap.

11. Claims 5 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo.

Kubo discloses substantially the same invention as the Applicant.

To the extent Applicant disagrees that Kubo discloses plating the through holes, it should be noted that the plating layer 15 (Fig. 33) on the terminals 14 is applied by plating.

One of ordinary skill in the art at the time the invention was made would have found it obvious to apply the same technique for depositing the solder on the walls of the through hole in order to simplify the manufacturing process.

12. Claims 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of Saia (US5657537 to Saia et al).

Kubo discloses the same invention as the Applicant except for injection molding the substrate about the cap and forming the hole simultaneously with disposing the cap within the substrate.

Saia teaches that it is known to form a substrate about a feedthrough structure by injection molding the substrate while the structure is held in place (col. 3, Ins. 35-40). Clearly the hole is formed simultaneously with the feedthrough structure being disposed within the substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kubo in view of the teachings of Saia, by injection molding the substrate about the cap of Kubo, thus forming the hole simultaneously with disposing the cap within the substrate. One of ordinary skill in the art would have been motivated to do so in order to be able to use the type of plug disclosed by Kubo in a molded plastic substrate rather than being limited to the substrates disclosed by Kubo.

13. Claims 23, 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo in view of Pierce (US3384955).

Kubo discloses the same invention as the Applicant except for retaining the cap within the hole using an adhesive, forming the substrate by injection molding it around the cap, or forming the hole simultaneously with disposing the cap within the substrate.

Pierce teaches that it is known in the prior art to retain components in a circuit board using an adhesive (col. 1, lns. 55-70). Piers also teaches a method of retaining components in a substrate by injection molding the substrate about the components (see abstract), thus forming the hole simultaneously with disposing the components in the substrate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Kubo in view of the teachings of Pierce, by injection molding the substrate about the cap of Kubo or employing an adhesive to retain the cap within the substrate. One of ordinary skill in the art would

have been motivated to do so in order to be able to use the type of plug disclosed by Kubo without being limited to the substrates and joining methods disclosed by Kubo.

Response to Arguments

14. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Livius R. Cazan whose telephone number is (571) 272-8032. The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571)272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LRC 01/07/2007

A handwritten signature in black ink, appearing to read 'Peter Vo', with a long horizontal line extending from the end of the signature.

PETER VO
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700